



Conceptualization of DNAPL persistence and distribution with DNAPL mass loss due to diffusion in water-saturated fractures in a porous medium (such as a fractured clay till or sedimentary rock) as a function of: a) time; and b) fracture size (aperture). Diffusion halos around fractures containing DNAPL become large (more developed) with increases in time, as shown with the concentration vs. distance plots for the three relative time periods in part a. At any particular time t_1 , the DNAPL mass distribution will vary in different size fractures, with DNAPL disappearance occurring most rapidly in the smallest fractures; residual or disconnected DNAPL will be present in medium-sized fractures, and free DNAPL will be present in the largest fractures that are connected to overlying DNAPL pools. DNAPL disappearance times (t_D) increase with an increase with fracture aperture.

Figure 3. Matrix diffusion as explained by Pankow and Cherry, 1996.